JBL

SYNTHESIS

SYNTHESIS
S400A/S650A
POWER AMPLIFIER
USER'S MANUAL

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JBL Synthesis S400A/S650A Power Amplifier
User's Manual

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H A Harman International Company

1.1 Important Safeguards For Audio Products

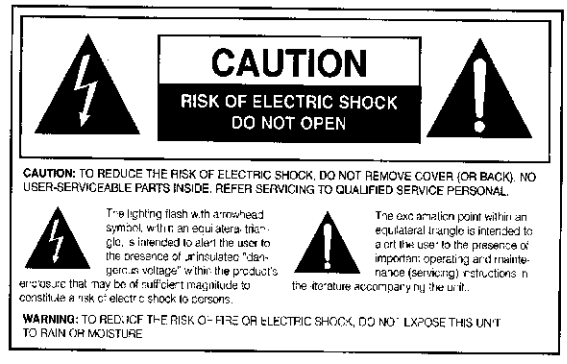
PLEASE READ CAREFULLY ALL THE FOLLOWING IMPORTANT SAFEGUARDS THAT ARE APPLICABLE TO YOUR EQUIPMENT

1. ***Read instructions*** – *All the safety and operating instructions should be read before the product is operated.*
2. ***Retain instructions*** – *The safety and operating instructions should be retained for future reference.*
3. ***Heed Warnings*** – *All warnings on the product and in the operating instructions should be adhered to.*
4. ***Follow Instructions*** – *All operating and use instructions should be followed.*
5. ***Water and Moisture*** – *The product should not be used near water – for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, and the like.*
6. ***Carts and Stands*** – *The product should be used only if a cart or stand is recommended by the manufacturer.*

6a. *A product and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the product and cart combination to overturn.*

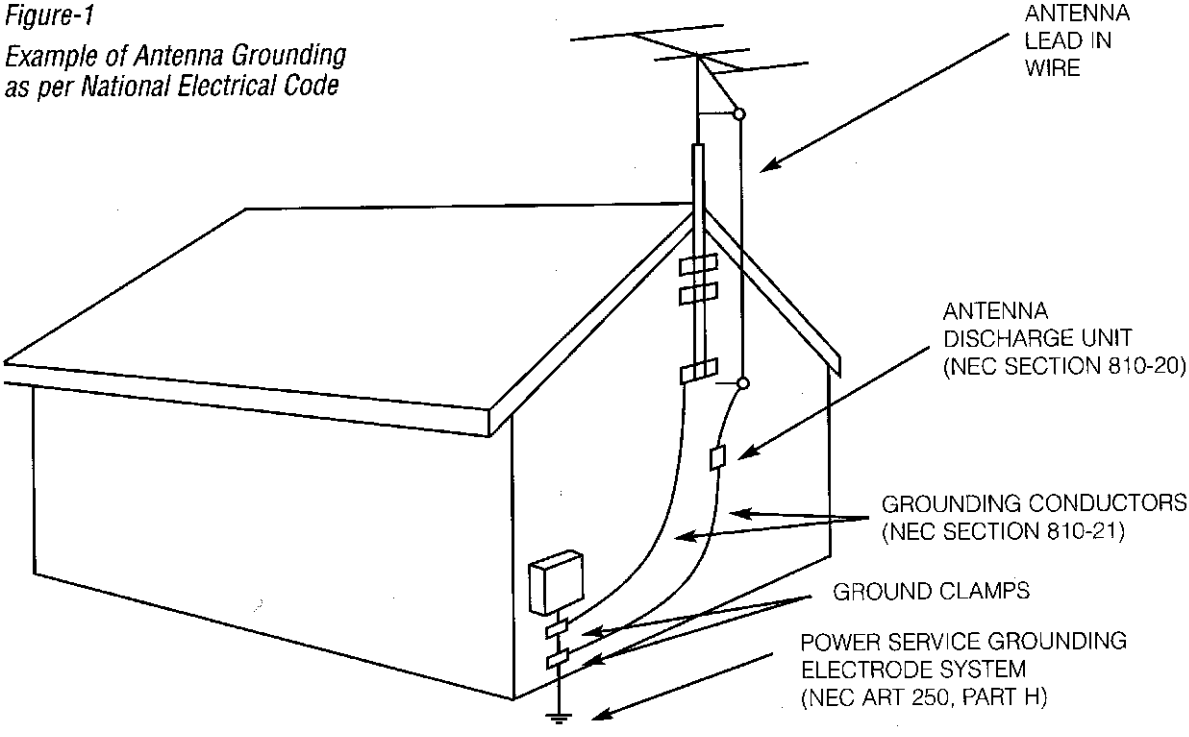
7. ***Wall or Ceiling Mounting*** – *The product should be mounted on a wall or ceiling only when and as recommended by the manufacturer.*
8. ***Ventilation*** – *The product should be situated so that its location or position does not interfere with its proper ventilation. For example, the product should not be situated on a bed, sofa, rug, or similar surface that may block the ventilation openings; or, placed in a built-in installation, such as a bookcase or cabinet that may impede the flow of air through the ventilation openings.*
9. ***Heat*** – *The product should be situated away from heat sources such as radiators, heat registers, stoves, or other products that produce heat. If placed near an amplifier, check with the manufacturer for applicability.*

CAUTION: TO PREVENT ELECTRIC SHOCK, DO NOT USE THIS (POLARIZED) PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.
ATTENTION: POUR PREVENIR LES CHOCS ELECTRIQUES NE PAS UTILISER AVEC UN PROLONGATEUR, UNE PRISE DE COURANT OU UNE AUTRE SORTIE DE COURANT SAUF SI LES LAMES PEUVENT ETRE INSEREES A FOND SANS EN LAISSER AUCUNE PARTIE A DECOUVERT.


CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONAL.
The lighting flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.
The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the unit.
WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE

10. ***Power Sources*** – *The product should be connected to a power supply only of the type described in the operating instructions or as marked on the product.*
11. ***Grounding or Polarization*** – *Precautions should be taken so that the grounding or polarization means of a product is not defeated.*
12. ***Power-Cord Protection*** – *Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the product.*
13. ***Cleaning*** – *The product should be cleaned only as recommended by the manufacturer.*
14. ***Power Lines*** – *An outdoor antenna should be located away from power lines.*
15. ***Nonuse Periods*** – *The power cord of the product should be unplugged from the outlet when left unused for a long period of time.*
16. ***Object and Liquid Entry*** – *Care should be taken so that the objects do not fall and liquids are not spilled into the enclosure through the openings.*

Figure-1
Example of Antenna Grounding as per National Electrical Code


ANTENNA LEAD IN WIRE
ANTENNA DISCHARGE UNIT (NEC SECTION 810-20)
GROUNDING CONDUCTORS (NEC SECTION 810-21)
GROUND CLAMPS
POWER SERVICE GROUNDING ELECTRODE SYSTEM (NEC ART 250, PART H)

17. ***Outdoor Antenna Grounding*** – *If an outside antenna is connected to the receiver, be sure the antenna system is grounded so as to provide some protection against voltage surges and built-up static charges. Article 810 of the National Electrical Code, ANSI/NFPA 70, provides information with regard to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna-discharge unit, size of grounding conductors, location of antenna-discharge unit, connection to grounding electrodes, and requirements for the grounding electrode (See Figure 1).*

18. ***Damage Requiring Service*** – *The product should be serviced by qualified service personnel when:*
    - ***a.*** *The power supply or the plug has been damaged; or*
    - ***b.*** *Objects have fallen on, or liquid has been spilled into, the product; or*
    - ***c.*** *The product has been exposed to rain; or*
    - ***d.*** *The product does not appear to operate normally or exhibits a marked change in performance; or*
    - ***e.*** *The product has been dropped, or the enclosure damaged.*

19. ***Servicing*** – *The user should not attempt to service the product beyond that described in the operating instructions. All other servicing should be referred to qualified service personnel.*

Note to CATV system installer:
This reminder is provided to call the CATV system installer's attention to Article 820-22 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

Deutsch
Wichtige Sicherheitsanweisungen

Heben Sie sich diese Sicherheitsanweisungen auch für später auf.

Befolgen Sie alle auf der Vorrichtung stehenden Anweisungen und Warnungen.

Immer nur mit der richtigen Spannung verwendent Die Gebrauchsanweisungen des Herstellers informieren Sie über die elektrischen Anforderungen. Vergessen Sie nicht daß bei vershiedenen Betrievsspannungen ggf. auch verschiedene Leitungskabel und/oder Verbindungsstacker zu verwenden sind.

Stellen Sie die Vorrightung nicht in ein unbelüftetes Gateil oder unmittelbar über wärmeerzeugende Geräte wie z.B. Tonverstärker. Halten Sie die in den Produktspezifikationen angegebene maximale Umgebungstemperatur bei Betrieb ein.

Schlitze und Öffnungen im GehUause dienen der Belüfung; um verläßlichen Betrieb sicherzustellen und Überheizen zu vermeiden dürfen diese Öffnungen nich verstopft oder abgedeckt werden. Stecken Sie nie irgend einen Gegenstand durch die Belüftungsschlitze. Vergießen Sie keine Flüssigkeiten auf den Apparat.

Dieses Produkt is mit einem 3-drahtigen Erdungsstecher ausgerüstet. Diese Sicherheitsmaßnahme darf nicht unwirksam gemacht werden.

Schließen Sie nie Tonverstärker unmittelbar an einen Anschluß des Apparates an.

Um elektrischen Schlag oder Feuer zu vermeiden, setaen Sie den Apparat weder Regen noch Feuchtigkeit aus und betreiben Sie ihn nicht dort wo Wasser eindringen könnte.

Versuchen Sie nicht den Apparat zu betreiben falls er fallen gelassen, beschädigt, oder Flüssigkeiten ausgesetzt wurde, oder falls sich seine Arbeitsweise derart ändert daß daraus ein Bedarf nach Raparatur zu schließen ist.

Dieser Apparat sollte nur von qualifizierten Fachleuten geöffnet werden. Das Abnehmen von Abdeckungen setzt Sie gefährlichen Spannungen aus.

Dieses Dreick auf ihrem Apparat warnt Sie voe nicht-isolierter, gefährlicher Spannung im Gehäuse...stark genug um eine Berührungsgetahr darzustellen.

Diese Dreick auf ihram Apparat bedeutet daß wichtige Betriebsund Wartungsanweisungen in der mitgelieferten Dokumentation zu finden sind.

Español
Instrucciones importantes de sequirdad

Guarde esta instrucciones para uso posterior.

Utilice siempre el voltaje correcto. Diríjase a las instrucciones de operación del fabricante para obtener las especificaciones de potencia. Esté al tanto de que voltajes de operación distintos requieren el uso de cable y/o enchufes distintos.

No instale esta unidad en un estante sin vntilación, ni tampoco directamente encima de equipose que generen calor tales como amplificadores de potencia. Fijese en las temperaturas ambientales máximas de operación que se mencionan en las especificaciones del producto.

Las aperturas y ranuras del chasis sirven para proveer la ventilación necesaria para operar la unidad con sequridad y para prevenir sobrecalentamiento, y por lo tanto no pueden ser obstruidas o cubiertas. No introcuzca objetos de ningún tip a través de las ranuras de ventilación, y nunca deje caer ningún líquido sobre la unidad.

Este producto está equipado con un enchufe de 3 clavijas con conexión a ierra. Este es un elemento de seguridad que no debe ser eliminado.

Nunca conecte ningún tipo de salida de amplificadores de sonido directamente a los conectores de la unidad.

Para prevenir descargas eléctricas o incendios, mantenga la unidad alejada de la lluvia, humedad o cualquier lugar en el que pueda entrar en contacto con ague.

No trate de hacer funcionar la unidad si se ha caído, está dañada, ha entrado en contacto con lfuidos, o si nota cualquir cambio brusco en su funcionamiento que indique la necesidad de hacerle un servicio de mantenimiento.

Esta unidad deberá ser abierta únicamente por personal calificado. Si usted quita las coberturas se expondrá a voltajes peligrosos.

Este triángulo que apaece en su componente le advierte sobre la existencia dentro del chasis de voltajes peligrosos sin aislantes...voltajes que son lo suficientemente grandes como para causar electrocución.

Este triángulo que aparece en su componente lo alerta sobre las instrucciones de operación y mantenimiento importantes que están en los materiales de lectura que se incluyen.

Français
Instructions de Sûreté Importantes

Gardex ces instructions pour réference future.

Observez toutes les instructions et tous les avertissements marqués sur l'appareil.

Branchez uniguements sur un réseau de tension indiquée. Consultez le manuel d'instruction du fabriquant pour les spécifications de courant. N'oubliez pas que différentes tensions peuvent nécessiter l'utilisation de cables et/ou de fiches deconnexion différents.

N'installez pas l'appareil en un compartiment non-aéré ou directement au-dessus d'équipements générateurs de chaleur, tels qu'amplificateurs de courants, etc. Ne dépassez pas la température ambiante maximale de fonctionnement indiquée dans les spécifications du produit.

Des fentes et ouvertures sont prévues dans le boîtier pour l'aération; Pour assurer le bon fonctionnement et pour prévenir l'échauffement, ces ouvertures ne doivent pas être couvertes ou bloquées. N'insérez pas d'objets dans les fentes d'aération. Empêchez tout liquide de se répandre sur l'appareil.

Ce produit est muni d'une fiche à trois fils pour la mise à terreee. Ceci est une mesure de sécurité et ne doit pas être contrariée.

Ne connectez jamais d'amplificateurs audio directement aux connecteurs de l'appareil.

Pour empêcher les chocs électriques et le danger d'incendie, évitez d'exposer l'appareil à la pluie ou à l'humidité, et ne le mettez pas en marche en un endroit où il serait exposé aux éclaboussures d'eau.

N'essayez pas de faire fonctionner l'appareil s'il est tombé à terre, a été endommangé, exposé à un liquide, ou si vous observez des différences nettes dans son fonctionnement, indiquant la nécessité de réparations.

Cet appareil ne doit être ouvert que par un personnel de service qualifié. En enlevant les couvercles vous vous exposez ades tensions électriques dangereuses.

Ce triangle, sur votre appaeil vous avertit de la présence de tension dangereuse, non-isolée à l'intérieur du boîtier...une tension suffisante pour représenter un danger d'electrocution.

Ce triangle sur sur votre appareil vous invite de suivre d'importantes instructions d'utillisation et d'entretien dans la documentation livrée avec le produit.

Italiano
Importanti norme di sicurezza

Conservare le presenti norme per l'utilizzo futuro.

Osservare tutte le istruzioni e le avvertenze apposte sull'unita.

Utilizzare esclusivamente con la tensione di rete corretta. Consultare le istruzioni operative fornite dal fabbricante per i dati riguardanti la tensione e l'assorbimento di corrente. Potrebbe essere necessario l'uso di cavi di rete e/o di spine diverse a seconda della tensione utilizzata.

Non installare l'unità in uno scaffale privo di ventilazione oppure direttamente sopra una fonte di calore, come, ad esempio, un amplificatore. Non superare la temperatura ambientale massima di funzionamento riportata nei dati tecnici del prodotto.

Le fessure e le altre aperture nella scatola servono alla ventilazione. Per un funzionamento affidabile, e per evitare un eventuale surriscaldamento, queste aperture non vanno ostruite o coperte in nessun modo. Evitare in tutti i casi di inserire oggetti di qualsiasi genere attraverso le fessure di ventilazione. Non versare mai del liquido di nessun tipo sull'unità.

QUesto pordotto viene fornito con una spina a 3 fili con massa. Tale dispositivo di sicurezza non va leiminato.

Evitare sempre di collegare le uscite dell'amplificatore auio direttamente ai connettori dell'unità.

Per prevenire il pericolo di folgorazione e di incendio non esporre l'unità alla pioggia o ad un'umidtà eccessiva; evitare di adoperare l'unità dove potrebbe entrare in contatto con acqua.

Evitare di adoperare l'unità se la stessa è stata urtata violentemente, se ha subito un danno, se è stata esposta ad un liquido o in caso di un evidente cambiamento dell prestazioni che indichi la necessità di un intervento di assistenza tecnica.

Ogni intervnto sull'unità va esaguito esclusivamente da personale qualificato. La rimozione della copertura comporta l'esposizione al pericolo di folgorazione.

Il present triangolo impresso sul componente avverte della presenza di tensioni pericolose non isolate all'interno della copertura...tali tensioni rappresentano un pericolo di folgorazione

Il presente triangolo imprsso sul componente avverte l'utente della presenza nella documentazione allegata di importanti istruzioni relative al funzionament ed alla manutenzione.

Dansk
Vigtig information om sikkerhed

Gem denne vejledning til senere brug.

Følg all anvisninger og advaresler på apparatet.

Apparatet skal altid tilsluttes den korrekte spænding. Der henvises til brugsanvisningen, der indeholder specifikationer for strømforsyning. Der gøres opmærksom på, at ved varierende driftsspændinger kan det blive nødvendigt at bruge andre ledninqs- og/eller stiktyper.

Apparated må ikke monteres i et kabinet uden ventilation eller lige over andet udstyr, der udvikler varme, f.eks. forstærkere. Den maksimale omgivelsestemperatur ved drift, der står opført i specifikationerne, skal overholdes.

Der er ventilationsåbninger i kainettet. For at sikre apparatets drift og hindre overophidning må disse åbninger ikke blokeres elle tildækkes. Stik aldrig noget ind igennem ventilationsåbningerne, og pas på aldrig at spilde nogen form for væske på apparatet.

Dette apparat er forsynet med et stik med jordforbindelse. Denne sikkerhedsforanstaltning må aldrig omgås.

Udgangsstik fra audioforstærkere må aldrig sættes direkte i apparartet.

Apparatet må ikke udsættes for regn eller fugt og må ikke bruges i nærheden af vand for at undgå risiko for elektrisk stød og brand.

Apparatet må aldrig bruges, hvis det er blevet stødt, beskadiget eller vadt, eller hvis ændringer i ydelsen typer på, at det trænger til eftersyn.

Fette apparat må kun åbnes af fagfolk, Hvis dæksiet tages af, udsættes man for livsfarlig højspænding.

Denne mærkat på komponenten advarer om uisoleret, farlig spænding i apparatet... høj nok til at give elektrisk stød.

Denne mærkat på komponenten advarer om vigtig driftsog vedligeholdsinformation i den tilhørende litteratur.

Suomi
Tärkeitä varten

Säilytä nämä ohjeet tulevaa käyttöä varten.

Seuraa kaikkia yksikköön merkittyjä ohjeita ja varoituksia.

Käytä aina oikeaa verkkojännitettä. Tehovaatimukset selviävät valmistajan käyttöohjeista. Huomaa, että eri käyttöjännitteet saattavat vaatia toisenlaisen verkkojohdon ja/tai- pistokkeen käytön.

Älä asenna yksikköä telineeseen jossa ei ole tuulet usta, tai välittömästi lämpöä tuottavien laitteiden, esim. tehovahvistimien, yläpuolelle. Ympäristön lämpötila käytössä ei saa ylittää twotespesifikaation maksimilämpötilaa.

Kotelo on varustettu tuuletusreiillä ja -aukiooa. Luotettavan toiminnan varmistamiksi ja ylilämiseksi näitä aukkoja ei saa sulkea tai peittää. Mitään esineitä ei saa työntää tuuletusaukkoihin. Mitään nestriä ei saa kaataa yksikköön.

Tuote on varustettu 3-jjohtimisella maadoitetulla verkkipistokkeella. Tämä on turvallisuustoiminne eikä sitä saa poistaa.

Älä kytke audiotehovahvistimen lähtöjä suoraan mihinkään yksikön liittimeen.

Sähköiskun ja palovaaran välttämiseksi yksikkö ei saa olla sateessa tai kosteassa, eikä sitä saa käyttää märässä ympäristössa.

Älä käytä yksikköä jos se on pudonnut, vaurioitunut, kostunut, tai jos sen suorituskkyky on huomattavasti muuttunut, maikä vaatii huoltoa.

Yksikön saa avata vain laitteeseen perehtynyt huoltohenkilö. Kansien poisto altistaa sinut vaaralisille jännitteliile.

Tämä kolmio, joka esiintyy homponentissasi, varoittaa siua eristämättömän vaarallisen jännitteen esiintymisestä yksikön sisällä. Tämä jännite saattaa olla riittävä korkea aiheuttamaan sähköiskuvaaran.

Tämä kolmio, joka esiintyy komponentissasi, kertoo sinulle, että tässä tuotedokumentoinnissa esiintyy tärkeitä käyttö-ja ylläpite-ohjeita.

Norsk
Viktig informasjon om sikkerhet

Ta vare pådenne veiledningen for senere bruk.

Følg alle anvisningene og advarslene som er angitt på apparatet.

Apparatet skal alltid anvendes med korrekt spenning.

Produktbeskrivelsen inneholder spesifikasjoner for strømkraav. Vær oppmerksom på at det ved ulike driftsspenninger kan være nødvendig å bruke en annen ledningog/eller støpseltype.

Apparatet skai ikke monteres i skap uten ventilasjon, eller direkte over varmeproduserende utstyr, som for eksempel kraftforsterkere. Den maksimale romtemperaturen som står oppgitt i produktbeskrivelsen, skal overholdes.

Apparatet er utstyrt med ventilasjonsåpninger. For at apparatet skal være pålitelig i bruk og ikke overopphetes, må disse åpningene ikke blikkeres eller tildekkes. Stikk aldri noe inn i ventilasjonsåpningene, og pass på at det aldri søtes noen form for væske på apparatet.

Dette apparatet er utstyrt med et jordet støpsel. Dette er en sikkerheitsforanstaltning som ikke må forandres.

Utgangsplugger fra audioforsterkere skai aldri koples direkte til apparatet.

Unngå brannfare og elektrisk støt ved å sørge for at apparatet ikke utsettes for regn eller fuktighet og ikke anvendes i næheten av vann.

Apparatet skal ikke brukes hvis det har blitt utsalt for støt, er skadet eller blitt vått, eller hvis endringer i ytelsen tyder på at det trenger service.

Dette apparatet skal kun åpnes av fagfolk. Hvis dekselet fjernes, utsettes man for livsfarlig høyspenning.

Komponenten er merket med denne trekanten, som er en advarsel om at det finnes uisolert, farlig spenning inne i kabinettet...høy nok til å utgjøre en fare for elektrisk støt.

Komponenten er merket med denne trkanten, som betyr at den tilhørende litteraturen inneholder viktige opplysninger om drift og vedikehold.

Svenska
Viktiga säkerhetsföreskrifter

Spara dess föreskrifter för framtida bruk.

Följ alla anvisningar och varningar som anges på engeten.

Använd alltid rätt nätspänning. Se tillverkarens bruksanvisningar för information om effektkrav. Märkväl, att andra matningsspänningar eventuellt kräver att en annan typs nätsladd och/eller kontakt anänds.

Installera inte enheten i ett oventilerat stativ, eller direkt ovanför utrustningar som avger värme, t ex effektförstärkare. Se till att omgivningens temperatur vid drift inte överskrider det angivna värdet i produktspecifikationen.

Behållaren är försedd med hål och öppningar för ventilering. För att garantera tillförlitlig funktion och förhindra överhettning får dessa oppninger inte blockeras eller täckas. Inga föremål får skuffas in genom ventilationshålen. Inga vätskor får spillas på enheten.

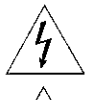
Produkten är försedd med en jordad 3-trådskontakt. Detta ä en säkerhetsfunktion som inte får tas ur bruk.

Anslut aldrig audioeffektförstärkarutgångar direkt till någon av enhetens kontakter.

För att undvika elstöt eller brandfara får eenheten inte utsättas för reegn eller fukt, eller användas på ställen där den blir våt.

Använd inte enheten om den far fallit i golbet, skadats, blivit våt, eller om dess prestanda förändrats märkbart, vilket kräver service.

Enheten får öppnas endast av behörig servicepersonal. Farliga spänningar blir tillgängliga när locken tas bort.



Denna triangel, som visas på din komponent, varnar dig om en oisolerad farlig spänning inne i engeten. Denna spänning är eventuellt så hög att fara för elstöt föreligger.

Denna triangel, som visas på din komponent, anger att viktiga bruksanvisningar och servideanvisningar ingår i dokumentationen i fråga.

Introduction

Congratulations on purchasing this JBL Synthesis S400A/S650A power amplifier! You have purchased a unit that represents the synthesis of everything that JBL has learned about the emotional power of audio and video in over fifty years of preeminence in the field. This amplifier has been designed and crafted to provide the user with a high level of sonic performance. Special attention has been paid towards minimizing the number of components in the audio signal path, resulting in extremely low distortion, excellent transient response, and wide dynamic range. This Synthesis amplifier sets new benchmarks in the use of high technology, and, when used as part of a JBL Synthesis System, will provide you with the experience of being in some of the world's greatest movie-houses and concert halls, right at home! In order to obtain the best performance from this unit, please be sure to completely read this users manual and use the S400A/S650A only in accordance with its instructions.

Features

This JBL Synthesis S400A/S650A power amplifier features the following:

THX® Ultra Licensed

This amplifier meets or exceeds the stringent specifications set by the Lucasfilm THX Audio division, some of which are for power handling, total harmonic distortion, frequency response, signal to noise ratio, slew rate, and crosstalk. As a result, when it is incorporated into a THX system, you will hear in your home exactly what the director and sound engineer heard in the recording studio.

Multi-Channel Amplification

Both the S400A and S650A have been designed to integrate well in the world of multi-channel audio. The S400A is a two channel amplifier that can also be mono-bridged for more power. When coupled with the five channels available in the S650A, you have the basis for a high end home cinema system!

High Power Capability

The S400A provides a monstrous 200 watts per channel of clean audio (<0.03% THD) into a four or eight ohm load, and 400 watts per channel when mono-bridged into an eight ohm load, making it ideal for powering subwoofers and surround speakers, which are typically less efficient than front speakers. The S650A provides a continuous 130 watts per channel through each of its five channels into eight ohm loads, and 190 watts into four ohm loads. Because of their power capabilities, these amps have an extremely wide dynamic range, a critical element in home cinema.

Auto Turn-On and Power Sequencing Circuitry

When used in a JBL Synthesis System, both the S400A and S650A can be turned on automatically whenever the surround processor is activated. No longer do you have to get out of that chair to turn on the amplifiers in your entertainment system; just one touch on the remote control of the surround processor, and you're there!

Due to the high current demands of power amplifiers during power-up, the S400A and S650A amplifiers are equipped with a built-in power sequencing circuit, which turns on each unit, one by one.

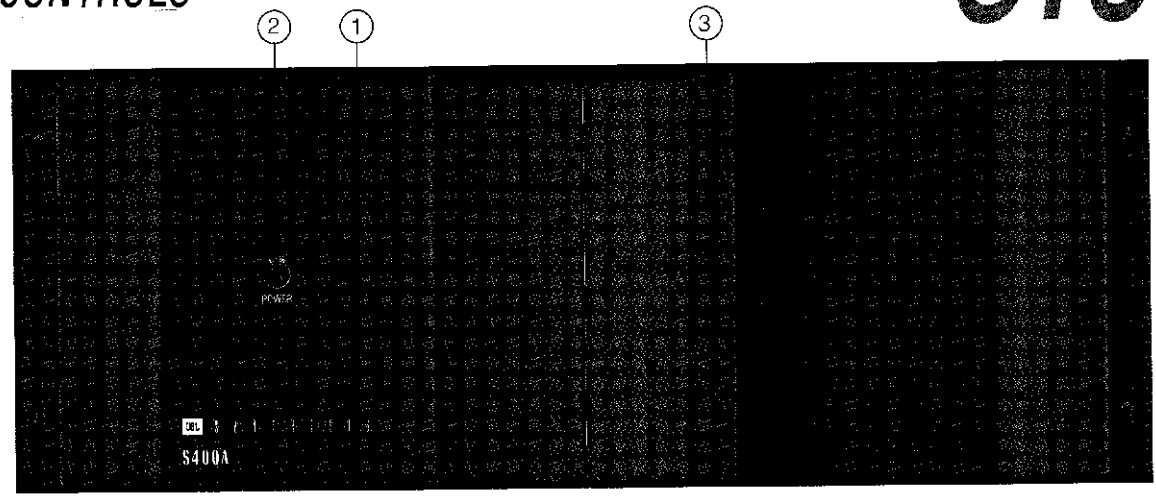
Discrete Power Supplies and Amplifier Sections

The S650A has a discrete power supply and amplifier section for each channel, which solves many problems inherent in single supply designs. As a result, the S650A has virtually no crosstalk between channels. Furthermore, each channel operates independently, guaranteeing maximum rated power to any or all channels at any time.

Level-Controlled Forced Air Cooling

The S650A utilizes a fan to cool the five amplifier channels and to ensure longterm reliability. To make sure that no fan noise is injected into the listening area, a feedback control circuit has been employed that only activates the fan when the output of any channel exceeds a certain level, so that the audio masks the fan noise.

OPERATION AND
CONTROLS 3.0



3.1 S400A

1. Power Switch

Push this button to turn on the unit. If the amplifier is used as part of a JBL Synthesis System, and the ***Manual On/Auto On*** *switch is in the* ***Auto On*** *position, the amplifier will turn on only if the surround processor is activated. Otherwise, set this switch to the Manual On position for the switch to control the power.*

2. Standby Indicator (red)

This indicator, above the power switch, will glow red when the amplifier is in the off or standby position. Once the unit is turned on, this light will shut off.

3. Power Indicators (blue)

These indicators will light up when the power amplifier is turned on.

4. Input Jacks (Ch.1 and Ch.2)

If you are using the S400A as a stereo power amplifier, connect the signal output(s) from the equalizer or surround processor into these jacks. If you are using the S400A in the mono-bridged mode, connect the subwoofer signal output from the equalizer into the Ch.1 jack only, and put the ***Stereo/Mono*** *switch in the* ***Mono*** *position.*

5. Stereo/Mono Switch

If you are using the S400A as a stereo power amplifier, put this switch in the ***Stereo*** *position. If the S400A is being used in the mono-bridged mode, put the* ***Stereo/Mono*** *switch in the* ***Mono*** *position, and set the* ***4Ω/8Ω*** *selector switch to the 4Ω position, regardless of the speaker impedance.*

6. Speaker Terminals

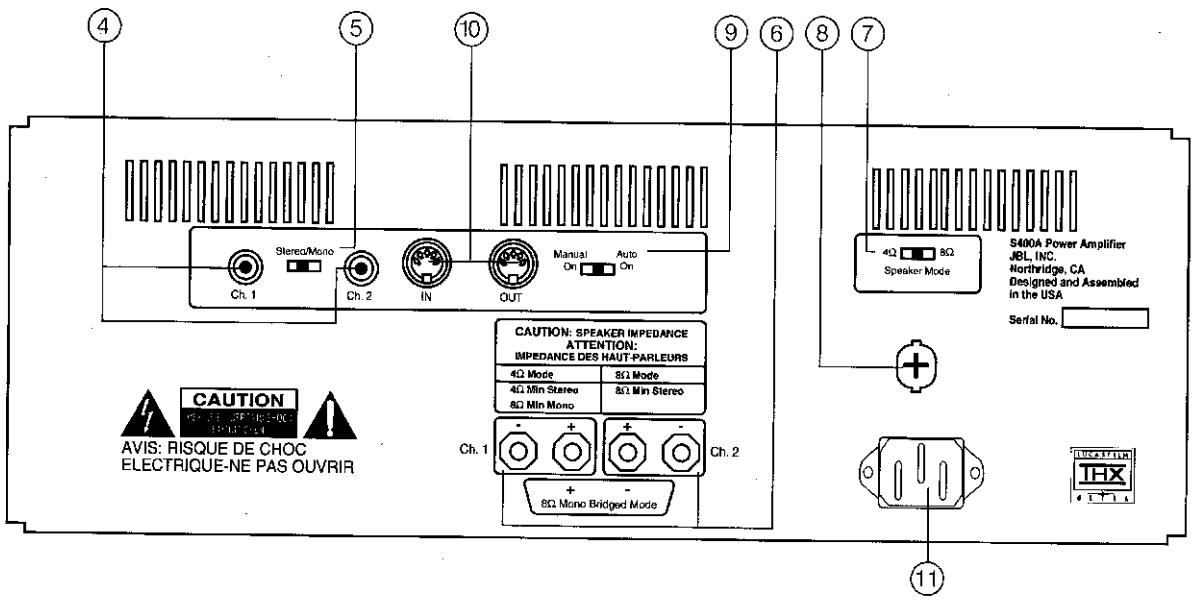
Connect your speakers to these terminals, following the normal convention, which is to wire the + side of the speaker to the red terminal, and the - side to the black terminal. The terminals for Channel 1 are the two on the left, with those for Channel 2 on the right. Use all four terminals when using the amplifier in the stereo mode of operation. Remember to wire the speakers in the proper polarity, or reverse phasing could occur, resulting in poor low frequency performance or poor imaging.

In the mono mode, connect the speaker to the center red terminals. Be sure to wire the + terminal of the speaker to the leftmost red terminal, and the - terminal of the speaker to the rightmost red terminal.

NOTE: The minimum load impedance that this amplifier can handle is four ohms per channel in stereo operation, and eight ohms in mono. Using lower impedance loads can damage the unit and will void your warranty!

7. 4 Ω/8 Ω selector switch

In the stereo mode, put this switch in the position that corresponds to the impedance of speakers being used. If 6 ohm speakers are being used, keep this switch in the ***4Ω*** *position. In the* ***mono*** *mode* ***always*** *keep this switch in the* ***4Ω*** *position. Failure to put the switch in the proper position can damage the amplifier and void the warranty.*



8. Fuse Holder

An external fuse has been incorporated in the S400A to protect it from short circuit and other fault conditions. In case of a blown fuse, always replace it with a fuse of equivalent rating and type. The fuse information is listed on the label next to the fuseholder.

9. Auto On/ Manual On Switch

Put this switch in the ***Auto On*** *position if the amplifier is being used as part of a JBL Synthesis System. When used in this way, the S400A will automatically turn on when the power switch is depressed and the surround processor is activated. For other installations, put this switch in the Manual On position. The amplifier will then turn on with the power switch alone.*

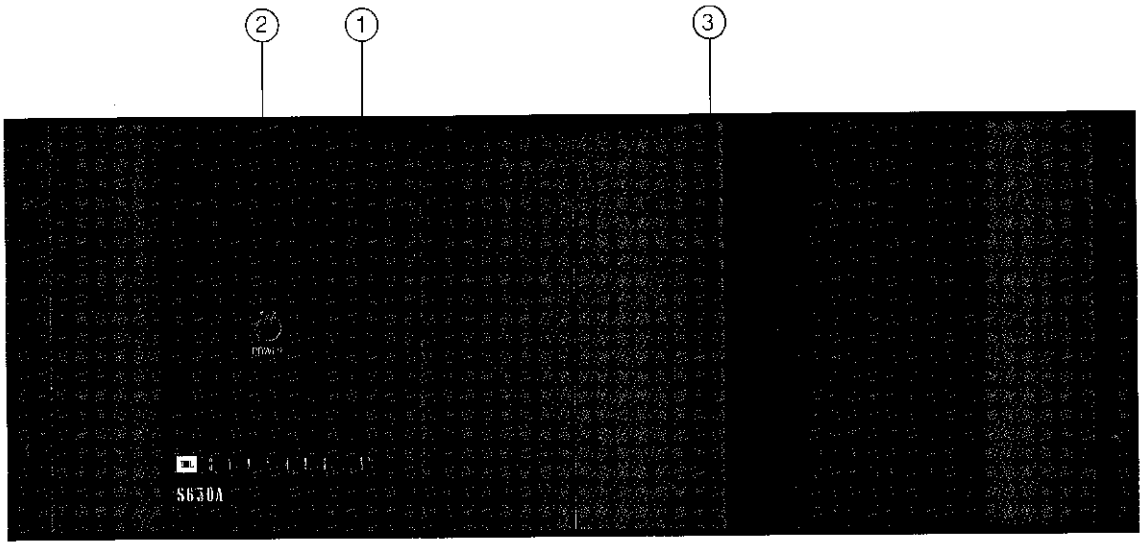
10. IN/OUT Din Jacks

If you are using the amplifier with the JBL Synthesis System, it is necessary to use these jacks to daisychain to other system components, so that control signals can be transmitted from one unit to the next. Follow the connection diagram in the following pages corresponding to the appropriate Synthesis system for detailed information regarding this connection. Make connections to these jacks only as shown in the diagrams. ***If these jacks are used in any other manner, for example to control electric screens, the unit can be damaged and the warranty will be void. For specific electrical information on these jacks, contact JBL Synthesis Customer Service at (800) 336-4JBL.***

Do not plug anything into these jacks if you are not using the S400A with a JBL Synthesis System.

11. AC Inlet

Your S400A is shipped with an IEC-type removeable power cord that mates with the AC inlet. In order to ensure proper operation, use the supplied power cord. This amplifier is NOT a multi-voltage unit. Using a power cord with a different connection to the AC wall receptacle will void the warranty.



3.2 S650A

1. Power Switch

Push this button to turn on the unit. If the amplifier is used as part of a JBL Synthesis System, and the ***Manual On/Auto On*** *switch is in the* ***Auto On*** *position, the amplifier will turn on only if the surround processor is activated. Otherwise, set the switch to the Manual On position, for the switch to control the power.*

2. Standby Indicator (red)

This indicator right above the power switch will glow red when the amplifier is in the off or standby position. Once the unit is turned on, this light will shut off.

3. Power Indicators (blue)

These indicators will light up when the power amplifier is turned on. On the S650A, the lights (from top to bottom) correspond to channels 1 through 5 respectively.

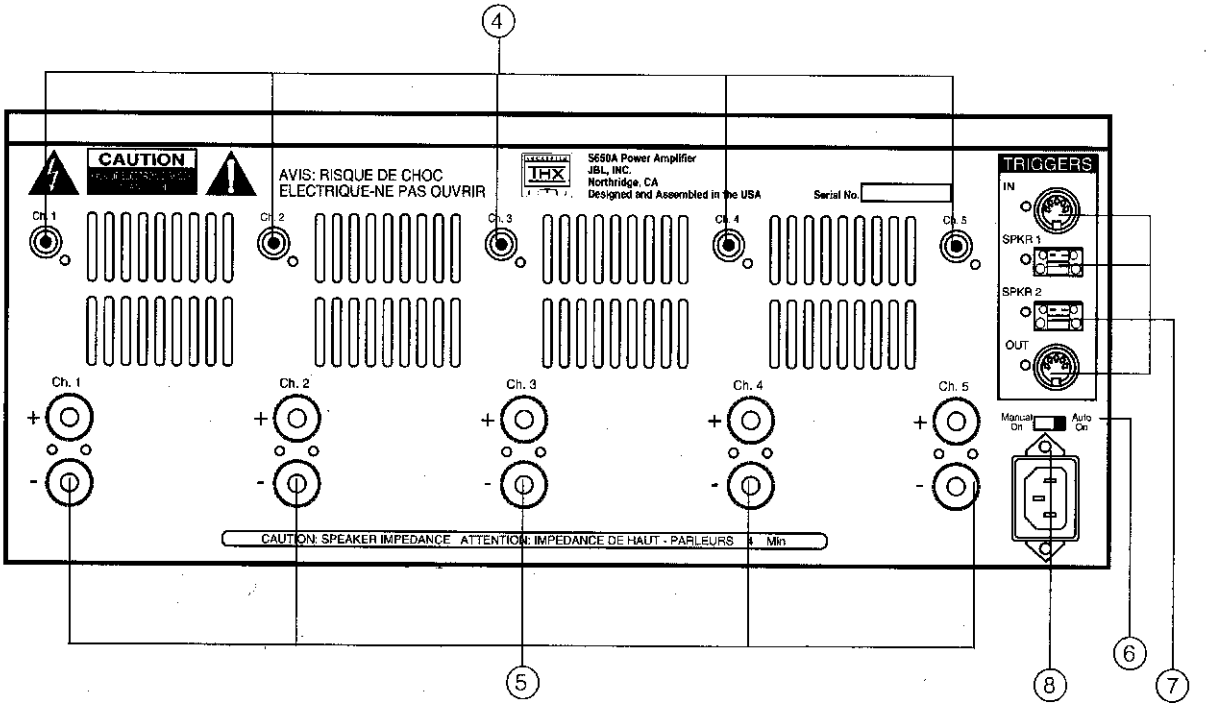
4. Input Jacks (Ch.1 through Ch.5)

Connect the signal outputs from your surround processor or equalizer to these jacks.

5. Speaker Terminals

Connect your speakers to these terminals, following the normal convention, which is to wire the + side of the speaker to the red terminal, and the - side to the brown terminal. The terminals for Channel 1 are the on the left, with those for Channel 5 on the right. Remember to wire the speakers in the proper polarity, or reverse phasing could occur, resulting in poor low frequency performance or poor imaging.

Wire Run Length	Recommended Gauge
Up to 20'	16
Up to 50'	14
Up to 100'	12



NOTE: The minimum load impedance that this amplifier can handle is four ohms per channel. Using lower impedance loads can damage the unit and will void your warranty!

6. Auto On/Manual On Switch

*Put this switch in the **Auto On** position if the amplifier is being used as part of a JBL Synthesis System. When used in this way, the S650A will automatically turn on when the power switch is depressed and the surround processor is activated. For other installations, put this switch in the **Manual On** position. The amplifier will then turn on with the power switch alone.*

7. Trigger Connections

If you are using the amplifier with the JBL Synthesis System, it is necessary to use these jacks to daisychain to other system components, so that control signals can be transmitted from one unit to the next. Follow the connection diagram in the following pages corresponding to the appropriate Synthesis system for detailed information regarding this connection. Make connections to these jacks only as shown in the diagrams. The SPKR1 and SPKR2 screw terminal connectors are removable for troubleshooting purposes.

If these jacks are used in any other manner, for example to control electric screens, the unit can be damaged and the warranty will be void. For specific electrical information on these jacks, contact JBL Synthesis Customer Service at (800) 336-4JBL.

Do not plug anything into these jacks if you are not using the S650A with a JBL Synthesis System.

8. AC Inlet

Your S400A is shipped with an IEC-type removeable power cord that mates with the AC inlet. In order to ensure proper operation, use the supplied power cord. This amplifier is NOT a multi-voltage unit. Using a power cord with a different connection to the AC wall receptacle will void the warranty.

4.1 Synthesis Hookup – Tips For Making It All Work The First Time

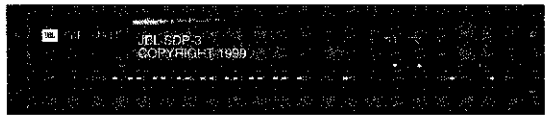
Use the simplified connection diagrams on the following pages to help you understand how to connect the S400A/S650A amplifiers to a JBL Synthesis System. These diagrams are intended to show the signal flow through the system.

There are a few points that you should remember when inter-connecting this system:

1. *A Synthesis One installation incorporates a total of four power amplifiers, two S400A's and two S650A's. Eight of the ten channels on the S650A's are to be used for driving the HI frequency and LO frequency inputs on the left, center, and right speakers, as well as the side ambient speakers. If you look at the connection chart on the following pages, you will find that there are two spare output channels on the S650A. If desired, these channels can be connected to the rear outputs on the surround processor for additional rear ambient speakers. They can also be used to drive additional speakers in other areas. The S400A's are mono-bridged, and each drives one subwoofer. Don't forget to make sure that the* ***4Ω/8Ω*** *switch is in the* ***4Ω*** *position. Also, verify that the subwoofers are connected to the red terminals of the amp.*
2. *A Synthesis Two or Three installation incorporates at least two power amplifiers, one or more S400As and one S650A. All five channels on the S650A are to be used for driving the left, center, right, and side speakers with the S400A running in stereo mode to drive the subwoofers. Make sure that the* ***4Ω/8Ω*** *switch is in the* ***8Ω*** *position. An additional S400A may be used to drive rear surround speakers. Make sure that the amp is running in stereo mode.*
3. *Connect the DIN cables between system components, as shown on the following pages. Make sure that on all power amplifiers, the power switches are in the depressed, or* ***ON*** *position. Finally, verify that the* ***Auto On/ Manual On*** *switches are in the* ***Auto On*** *position. This way, the system will work as it was intended; all of the components will power up together, just by one touch of the power button on the surround processor's remote control.*

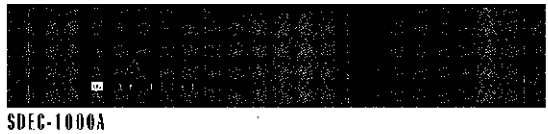
THAT'S IT! WITH THESE CONNECTIONS PROPERLY MADE, YOU SHOULD HAVE NO PROBLEMS WITH THE NEXT PART.

4.2 Synthesis One
Suggested Rack Mounting Order

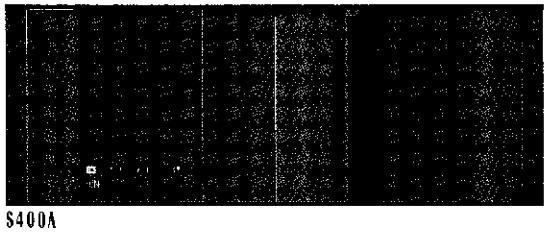


SDP-3

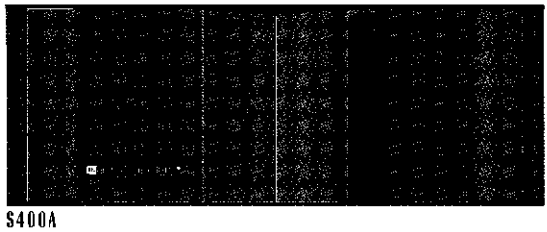
SDP-RFD



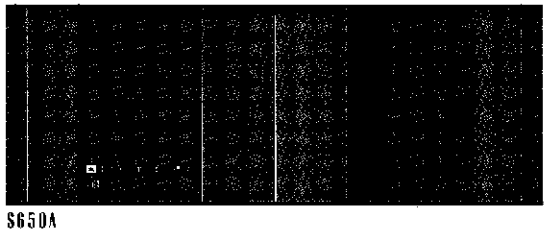
SDEC-1000A



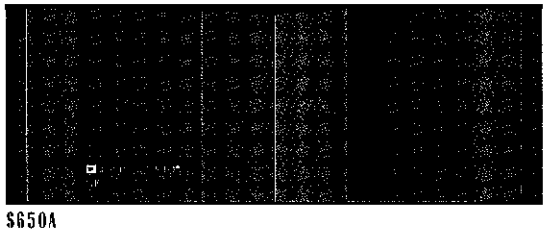
S400A



S400A

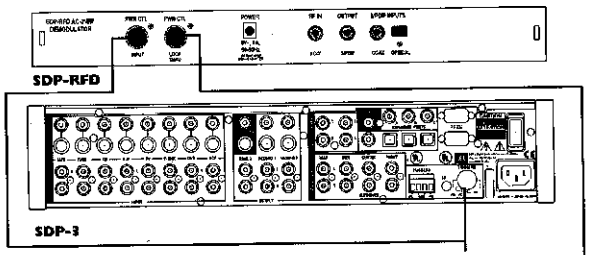


S650A

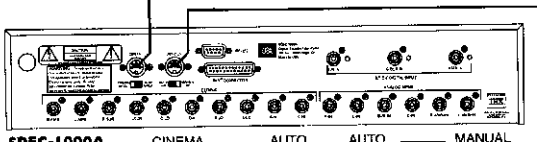


S650A

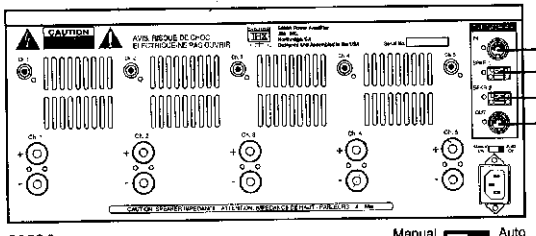
4.3 Synthesis One Control Wiring Diagram

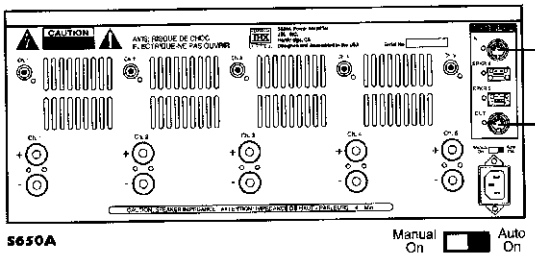


See Note 2.

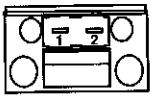


(Use "Cinema Mode" position only when there are no music mode speakers in the system.)





SPEAKER CONTROL JACK

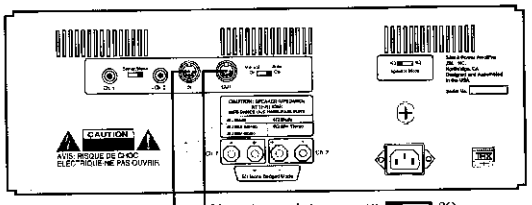


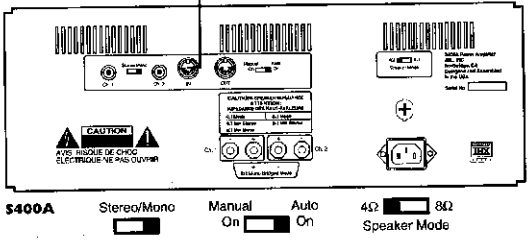
PIN 1 Ground
PIN 2 +5vdc in Cinema mode

CONTROL JACK SIGNALS

PIN 1 Ground
PIN 2 Ground
PIN 3 +5vdc when Power is on
PIN 4 Not Used
PIN 5 +5vdc in Cinema mode

TO SPEAKERS





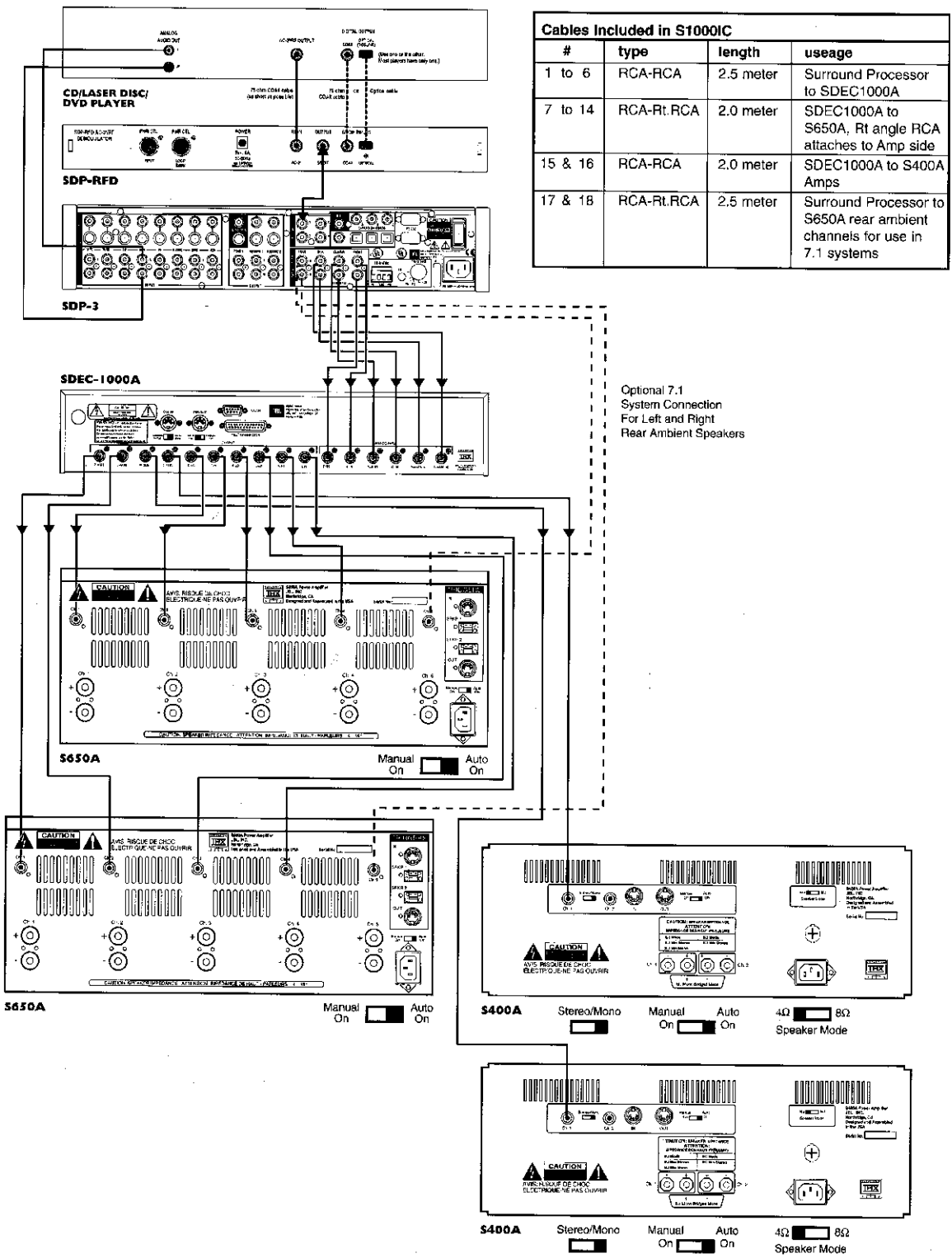
NOTES

1) *To ensure proper operation, connect the system control lines exactly as indicated.*

2) *In the event there is no SDP-RFD, connect the control line from the SDP-3 directly to the "DIN IN" connector on the SDEC-1000A.*

3) *If any of the control lines become disconnected while the system is on, turn off all Synthesis components before reconnecting control lines. This will reset all operation.*

4.4 Synthesis One Interconnection Diagram



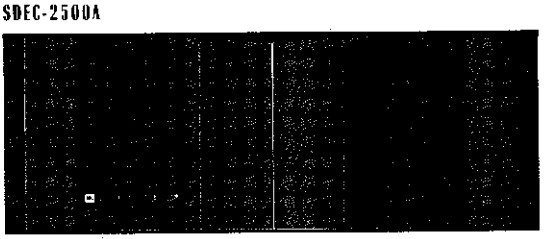
Cables Included in S1000IC			
#	type	length	useage
1 to 6	RCA-RCA	2.5 meter	Surround Processor to SDEC1000A
7 to 14	RCA-Rt.RCA	2.0 meter	SDEC1000A to S650A, Rt angle RCA attaches to Amp side
15 & 16	RCA-RCA	2.0 meter	SDEC1000A to S400A Amps
17 & 18	RCA-Rt.RCA	2.5 meter	Surround Processor to S650A rear ambient channels for use in 7.1 systems

4.5 Synthesis Two and Three Suggested Rack Mounting Order

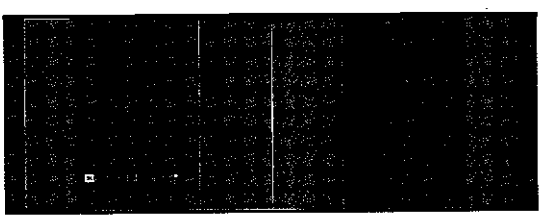
SDP-3

SDP-RFD

SDEC-2500A

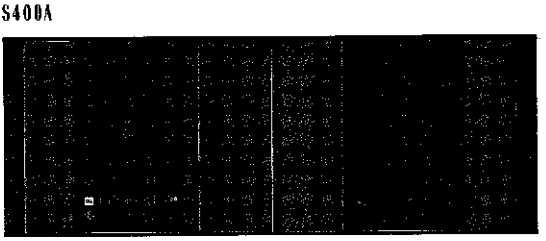


S400A



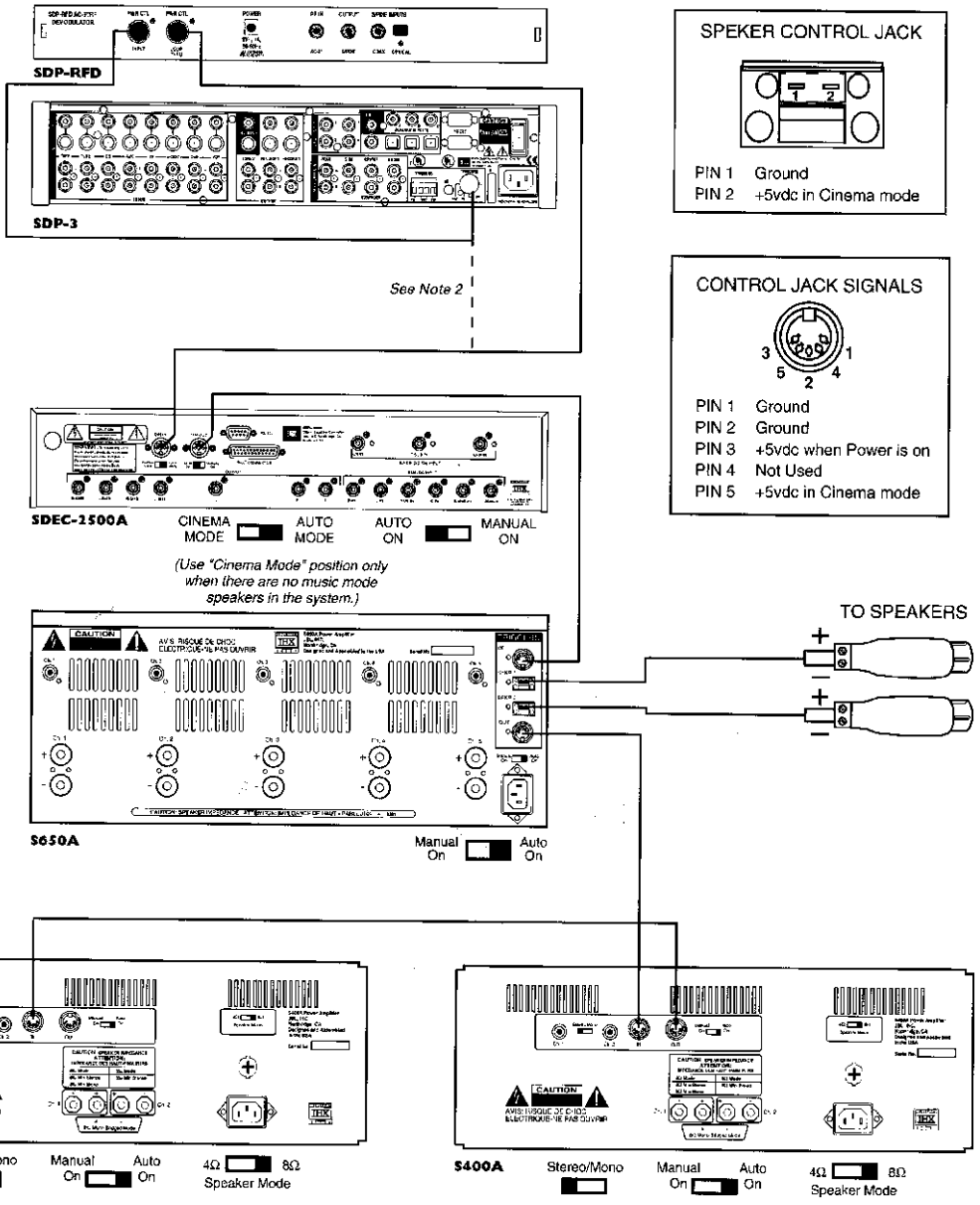
S400A

Optional For 7.1 Systems



S650A

4.6 Synthesis Two and Three Control Wiring Diagram



SPEKER CONTROL JACK

PIN 1 Ground
PIN 2 +5vdc in Cinema mode

CONTROL JACK SIGNALS

PIN 1 Ground
PIN 2 Ground
PIN 3 +5vdc when Power is on
PIN 4 Not Used
PIN 5 +5vdc in Cinema mode

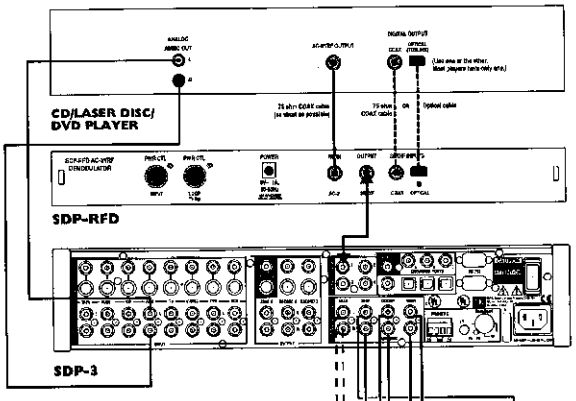
NOTES

1) *To ensure proper operation, connect the system control lines exactly as indicated.*

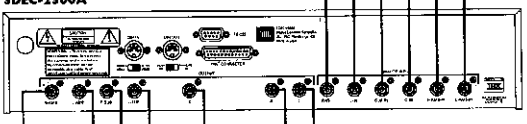
2) *In the event there is no SDP-RFD, connect the control line from the SDP-3 directly to the "DIN IN" connector on the SDEC-2500A.*

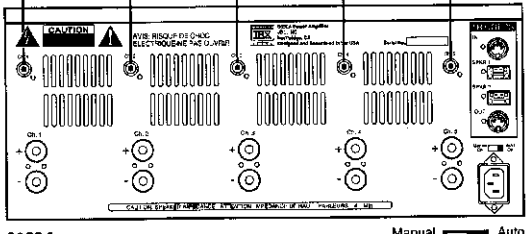
3) *If any of the control lines become disconnected while the system is on, turn off all Synthesis components before reconnecting control lines. This will reset all operation.*

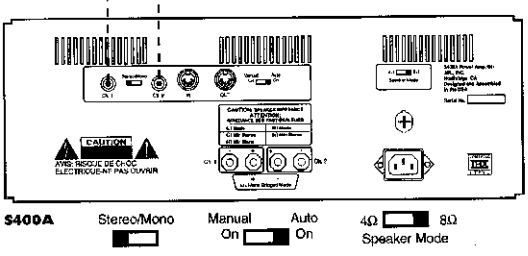
4.7 Synthesis Two and Three Interconnection Diagram

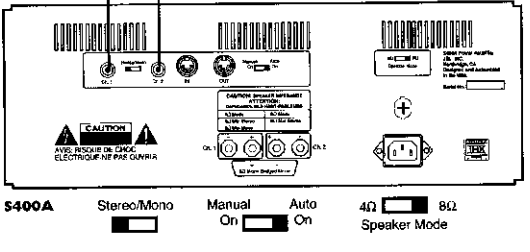


Optional 7 Channel









Cables included in S2500IC			
#	type	length	useage
1 to 6	RCA-RCA	2.5 meter	Surround Processor to SDEC2500A
7 to 11	RCA-Rt.RCA	2.0 meter	SDEC2500A to S650A, Rt angle RCA attaches to Amp side
12 & 13	RCA-RCA	2.0 meter	SDEC2500A to S400A Amps
14 & 15	RCA-Rt.RCA	2.5 meter	Surround Processor to S650A rear ambient channels for use in 7.1 systems

5.0 INSTALLING YOUR POWER AMPLIFIER

Installation of the S400A/S650A is a very straightforward process. Just remember the following points:

1. *Both the S400A and S650A power amplifiers have been designed to be mounted in an EIA standard rack, as well as to be stacked freestanding. If the amplifier is being mounted in a rack, then it is suggested that the feet be removed prior to installation. If the S400A/S650A will be stacked along with other components, be sure to use the feet that came attached to the unit. This will ensure that there is sufficient air space underneath so that heat can be dissipated effectively.*
2. *If both the S400A and S650A amplifiers are used in an installation, always keep the S650A on the bottom. Because of its weight, the S650A will be more stable if mounted close to the ground. Furthermore, since the S400A dissipates heat through the holes in its top cover, keeping it on top will allow it to "breathe" more easily.*
3. *Make sure that the amps are located in a well-ventilated, cool area. On the S400A, make sure there is adequate airflow around all sides of the amp. On the S650A, make sure that there is air space on the rear and bottom of the unit. On this amplifier, air is sucked in from the bottom and rear and pushed out of the front. It is very important not to obstruct the airflow from the center panel of the S650A or heat buildup and premature failure may occur.*

6.0 TROUBLESHOOTING

Problem: *Amplifier does not turn on. Neither the red or blue indicator lights are on.*

1. *Make sure that the amplifier is plugged in, and verify that there is the proper voltage at the wall outlet.*

Problem: *The red indicator lights, but the blue indicators do not light up when the power switch is depressed.*

1. *If the amp is being used with a Synthesis system, make sure that the surround processor is turned on.*
2. *If the amp is being used with a Synthesis system, make sure that all of the DIN cables are connected between system components. Refer to the "CONNECTING YOUR SYNTHESIS SYSTEM" section for reference.*
3. *If the amp is being used with a Synthesis system, make sure that the* ***Auto On/Manual On*** *switch is in the* ***Auto On*** *position.*
4. *If the amp is not being used with a Synthesis system, make sure that the* ***Auto On/Manual On*** *switch is in the* ***Manual On*** *position.*
5. *Check the fuses. If the problem exists with the S400A, first check the fuse located on the rear panel. If this doesn't solve the problem, then check the fuses under the top cover. If the problem exists with the S650A, then check the fuses under the top cover. Only replace with the same type and rating of the original fuse.* ***Replacing fuses can only be done by a JBL Authorized Dealer. If the wrong type of fuse is used or if the replacement is done by a non-JBL Authorized Dealer, the unit may be damaged and the warranty will be void.***

Problem: *On the S650A, not all of the blue indicators light up.*

1. *Remove the top cover and check the fuses.* ***Only replace with the same type and rating of the original fuse. Replacing fuses can only be done by a JBL Authorized Dealer. If the wrong type of fuse is used or if the replacement is done by a non-JBL Authorized Dealer, the unit may get damaged and the warranty will be void.***

Problem: *There is no audio coming out of the speakers, but the amplifier is on (blue indicators lit).*

1. *Make sure that the surround processor or equalizer is on, and that the correct source has been connected and selected.*
2. *Make sure that the correct outputs are connected from the surround processor or equalizer to the amp.*
3. *Make sure that the speakers are connected to the correct terminals. Check for short circuits at the speaker terminals.*

Problem: *Not all of the amplifiers turn on in a Synthesis system.*

1. *Make sure that all DIN cables are connected between system components. Refer to the "CONNECTING YOUR SYNTHESIS SYSTEM" section for reference.*
2. *Make sure that each amplifier has the* ***Auto On/Manual On*** *switch in the* ***Auto On*** *position.*

Problem: *There is not adequate output power to drive the speakers.*

1. *If the problem is with the S400A, make sure that the* ***4Ω/8Ω*** *switch is in the correct position, depending on the impedance of the speakers being used.*
2. *Check that the output levels of the surround processor or equalizer are set properly.*

Problem: *There is poor bass in the system.*

1. *Verify that the speakers have been wired to the amplifier in the correct polarity.*

Problem: *Speakers do not switch from music to cinema mode.*

1. *Make sure that the screw terminal and DIN adaptor cables to speakers are correctly wired and connected to the correct jacks on the S650A.*
2. *Make sure that the DIN cables are connected between system components.*

Problem: *There is hum coming out of the speakers.*

1. *Check the power outlets and make sure that there is a solid earth ground present.*
2. *Make sure that all signal cables are away from power cords.*
3. *If these suggestions fail, experiment by running ground wires between the rear panel screws of the amplifiers and the other system components, such as the surround processor or signal processing package.*

If you still encounter difficulty after trying the above suggestions, then call your JBL Authorized Dealer or JBL at ***(800) 336-4JBL*** *for further assistance.*

7.0 SPECIFICATIONS

	S400A	S650A
Rated Power Output	200W RMS into 4/8 ohms stereo 400W RMS into 8 ohms mono	130W RMS into 8 ohms, 190W RMS into 4 ohms
THD	<0.02% 20Hz-20kHz	<0.03% 20Hz-20kHz
Input Impedance	33k ohms	30k ohms
Input Sensitivity	1V in = 28.28V out (THX level)	1V in = 28.28V out (THX level)
Frequency Response (at 1 W)	<10hz-70kHz +0/-1db	<10hz-100kHz +0/-1db
S/N Ratio (A-weighted at rated power)	>105db	>116db
Damping Factor (8 ohms)	120	200
Dynamic Headroom	1.8dB	1.2dB
IM Distortion	0.01%	0.01%
Unit Size	7"H x 19"W x 18.5"D	7"H x 19"W x 21"D
Unit Weight	45 lbs	80 lbs
Shipping Weight	50 lbs	85 lbs

All features and specifications are subject to change without notice.
"LUCASFILM THX AUDIO" and "HOME THX CINEMA" are trademarks of Lucasfilm Ltd.

8.0 SYNTHESIS LIMITED WARRANTY

The JBL Synthesis products listed below are warranted for the period stated from the date of original purchase. Amplifiers, Equalizers and Surround Sound Processor—2 Year Warranty.

Who is protected by this warranty?

Your JBL warranty protects the original owner and all subsequent owners, so long as the original bill of sale is presented when warranty service is required.

What is covered by the JBL warranty?

Your JBL warranty covers all defects in material and workmanship with the following specified exceptions. These are (1) damage caused by accident, unreasonable use or neglect (including the lack of reasonable and necessary maintenance); (2) damage caused by improper installation or adjustment; (3) damage occurring during shipment (claims must be presented to the carrier); (4) damage to or deterioration of any accessory or decorative surface; (5) damage resulting from failure to follow instructions contained in your owner's manual; (6) damage resulting from the performance of repairs by someone other than an authorized JBL warranty station; (7) any JBL unit on which the serial number has been effaced, modified, or removed; (8) units which have been altered or modified in design, appearance or construction; (9) products sold on an "as-is" or final sale basis. This warranty covers only the actual defects within the product itself, and does not cover the costs of installation or removal from a fixed installation, normal set-up or adjustments, claims based on any misrepresentation by the seller, or performance variations resulting from installation related circumstances such as program source quality or AC power.

How to obtain warranty service.

If your JBL product ever needs service, we may direct you to an Authorized JBL Warranty Station, or ask you to send your unit to the factory for repair, in which case we'll also supply a Service Return Authorization and complete shipping instructions. If the product was purchased in a country other than the USA, it is necessary to return the product to the distributor or selling location in the same country. Either way, you'll need to present the original bill of sale to establish the date of purchase. Please do not ship your JBL product to the factory without our prior authorization. In the United States, please call 1-800-336-4JBL for the location of the authorized warranty station nearest you.

If service under this warranty is not necessary, but you have questions regarding the installation or operation of this unit, please contact your authorized JBL dealer or call 1-800-336-4JBL for further assistance.

Who pays for what?

JBL will be happy to pay all labor and material expenses for all repairs covered by this warranty. If necessary repairs are not covered by this warranty, or if a unit is examined which is not in need of repair, you will be charged for the repairs or the examination.

Although you must pay any shipping charges incurred in getting your JBL product to an Authorized Warranty Station or to the factory, we will pay return shipping charges within the United States if the repairs are covered by the warranty. Please be sure to save the original shipping cartons because a nominal charge will be made for additional cartons.

Limitation on implied warranties

IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE ARE LIMITED IN DURATION TO THE LENGTH OF THIS WARRANTY, UNLESS OTHERWISE PROVIDED BY STATE LAW.

EXCLUSION OF CERTAIN DAMAGES

JBL'S LIABILITY IS LIMITED TO THE REPAIR OR REPLACEMENT AT OUR OPTION, OF ANY DEFECTIVE PRODUCT AND SHALL IN NO EVENT INCLUDE INCIDENTAL OR CONSEQUENTIAL COMMERCIAL DAMAGES OF ANY KIND.

SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS AND/OR DO NOT ALLOW THE EXCLUSION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS AND EXCLUSIONS MAY NOT APPLY TO YOU.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

We sincerely thank you for your expression of confidence in JBL products. This equipment has been painstakingly assembled by highly trained craftspeople. It should give you many years of musical enjoyment.

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Part No. SA00A050A0M0(C)
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